New Evidence for the Antiquity of Fremont Occupation in Glen Canyon, South-central Utah

Phil R. Geib

Navajo Nation Archaeology Department
Northern Arizona University
P.O. Box 6013
Flagstaff, Arizona 86011

Abstract. Portions of the Glen Canyon National Recreation Area north of the Colorado River, especially the Escalante River basin, contain distinctive material remains interpreted as evidence of a Fremont occupation. Though never directly dated, this occupation was thought to have been contemporaneous with an A.D. 1050–1250 Anasazi occupation of Glen Canyon. To determine the actual age of the Fremont remains, 13 maize samples from five excavated sites of the Escalante River basin were radiocarbon dated. One date with a calibrated 1 sigma age range of 400–200 B.C. is substantially earlier than the rest and provides the current earliest direct date on maize from this portion of Utah. Eleven overlapping dates spanning the centuries circa A.D. 200–900 provide a basis for arguing that the Fremont occupation of Glen Canyon was earlier than previously supposed. The one date in the A.D. 1000's is associated with typical Anasazi remains to the near exclusion of Fremont material.

Key words: Chronometrics, Fremont, Glen Canyon, maize, Utah prehistory.

During the late 1950's and early 1960's, a large archaeological salvage program was conducted in and adjacent to Glen Canyon in south-central Utah and north-central Arizona due to the pending destruction of archaeological sites by the creation of Lake Powell (Fig. 1). The Glen Canyon Project, as it is commonly known, produced a significant body of archaeological data about Formative cultures and their environment (Jennings 1966; Lipe 1967). Anasazi remains were found throughout the Glen Canyon region, both north and south of the Colorado River. Fremont remains were also documented, including rod and bundle coiled basketry, sherds of Emery Gray and Snake Valley Gray, and distinctive figurines and moccasins. These remains were essentially restricted to north of the Colorado River and were especially prevalent at sites in tributary canyons of the Escalante River. Sites such as Sheep Horn Alcove and Pantry Alcove in Harris Wash contained only Fremont materials (Fowler 1963), whereas other sites, such as the Alvey Site in Coyote Gulch, contained a mixture of Fremont and Anasazi remains (Gunnerson 1959). Rock art,

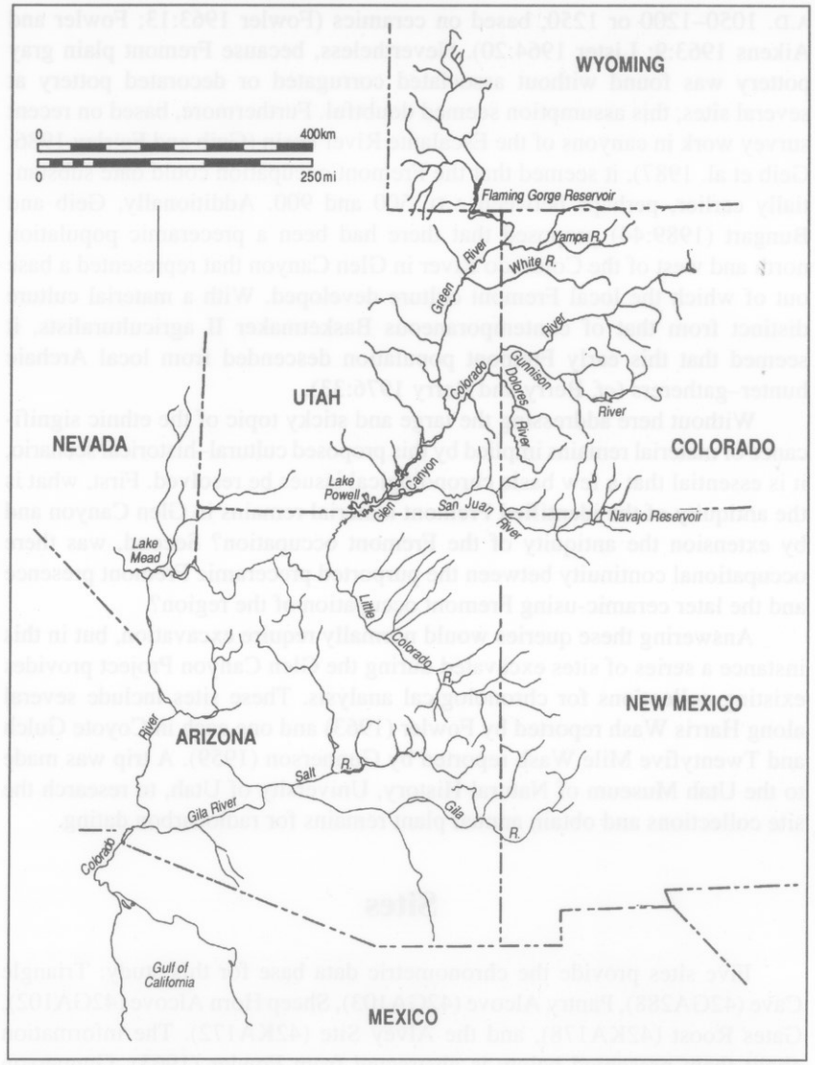

Fig. 1. Location of Glen Canyon.

particularly in the form of broad-shouldered, often horned anthropomorphs, is thought to be another material trace of the Fremont occupation. An anthropomorphic pictograph panel in Davis Gulch (see Fig. 46 in Gunnerson 1959:150) is considered an outstanding example of Fremont rock art in the Escalante River basin (Schaafsma 1971:56).

The Fremont occupation of Glen Canyon was assumed to be contemporaneous with an Anasazi occupation of the region dated approximately

A.D. 1050–1200 or 1250, based on ceramics (Fowler 1963:13; Fowler and Aikens 1963:9; Lister 1964:20). Nevertheless, because Fremont plain gray pottery was found without associated corrugated or decorated pottery at several sites, this assumption seemed doubtful. Furthermore, based on recent survey work in canyons of the Escalante River basin (Geib and Fairley 1986; Geib et al. 1987), it seemed that the Fremont occupation could date substantially earlier, perhaps between A.D. 500 and 900. Additionally, Geib and Bungart (1989:44) proposed that there had been a preceramic population north and west of the Colorado River in Glen Canyon that represented a base out of which the local Fremont culture developed. With a material culture distinct from that of contemporaneous Basketmaker II agriculturalists, it seemed that this early Fremont population descended from local Archaic hunter–gatherers (*cf.* Berry and Berry 1976:33).

Without here addressing the large and sticky topic of the ethnic significance of material remains implied by this proposed cultural–historical scenario, it is essential that a few basic chronological issues be resolved. First, what is the antiquity of the identified Fremont material remains in Glen Canyon and by extension the antiquity of the Fremont occupation? Second, was there occupational continuity between the purported preceramic Fremont presence and the later ceramic-using Fremont occupation of the region?

Answering these queries would normally require excavation, but in this instance a series of sites excavated during the Glen Canyon Project provides existing collections for chronological analysis. These sites include several along Harris Wash reported by Fowler (1963) and one each in Coyote Gulch and Twentyfive Mile Wash reported by Gunnerson (1959). A trip was made to the Utah Museum of Natural History, University of Utah, to research the site collections and obtain annual plant remains for radiocarbon dating.

Sites

Five sites provide the chronometric data base for this study: Triangle Cave (42GA288), Pantry Alcove (42GA103), Sheep Horn Alcove (42GA102), Gates Roost (42KA178), and the Alvey Site (42KA172). The information about them presented below is abstracted from Fowler (1963), Gunnerson (1959), and field notes on file at the Utah Museum of Natural History. The first three sites are in the lower stretch of Harris Wash; Gates Roost is in Twentyfive Mile Wash and the Alvey Site is in Coyote Gulch (Fig. 2). These three canyons, draining eastward from the Kaiparowits Plateau to the Escalante River, are narrow slots cut into the bedrock of the Escalante Desert. Holocene alluvial deposits with complex histories of filling and erosion (Boison 1983; Boison and Patton 1985) formed fertile and well-watered floors to these canyons at various times in the past. The canyon walls are largely formed of Navajo sandstone and contain numerous alcoves (dry, dome-shaped shelters of various size). The sites discussed here occupied the protected space of five such shelters.

Triangle Cave in Harris Wash and the Alvey Site in Coyote Gulch were the only two sites that had clearly defined strata. Five strata were recognized in Triangle Cave (Fowler 1963), whereas three major levels, each consisting of many separate layers, were identified in the Alvey Site (Gunnerson 1959). All of the cultural strata at both sites contained varying quantities of organic debris, including numerous remains of maize (*Zea mays*) and squash (*Cucurbita mixta* and *C. pepo*). Even at the deepest levels (nearly 3 m at the Alvey Site), domesticates had secure stratigraphic provenience. No marked stratigraphic breaks were evident at the other three sites, but reuse of the shelters over some length of time is indicated by cultural fill reaching depths of almost 1 m, the occurrence of storage cists and containers at various depths, and occasional cist superposition.

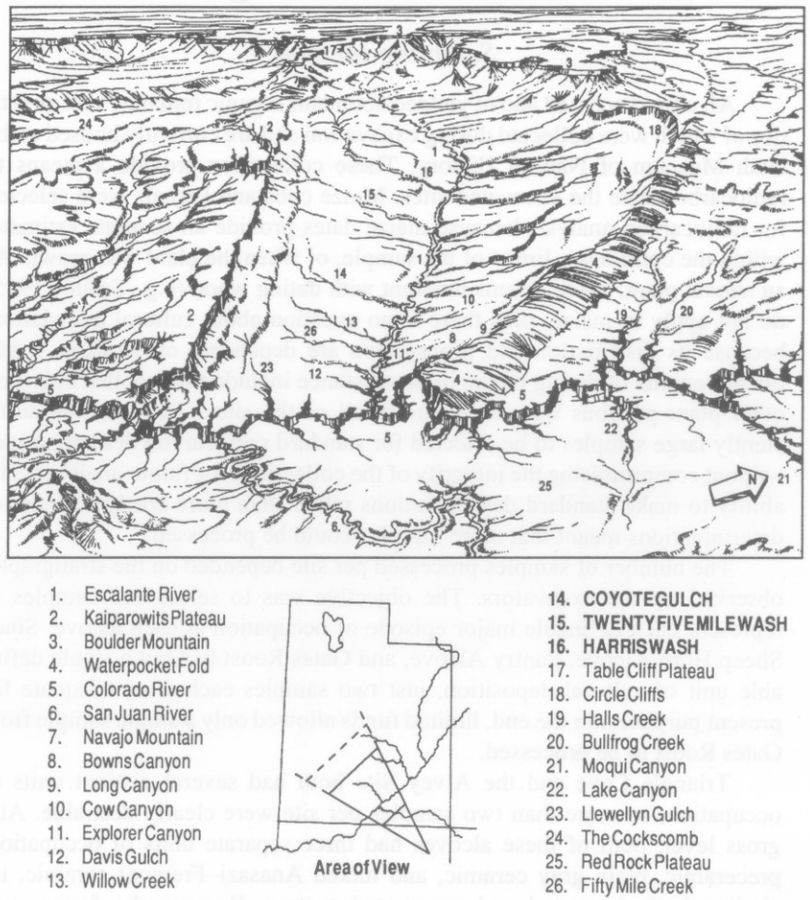

Fig. 2. Panoramic view of the Escalante River basin identifying key landforms and drainages (modified from Fig. 7 of Jennings 1966).

Each site contained features of various sorts, including slab-lined storage cists, unlined pits, unlined and slab-lined hearths, buried cucurbit and basketry storage containers, and living and storage structures. Pottery was recovered from all sites, although stratum 1 of Triangle Cave and level I and several layers of level II of the Alvey Site were aceramic. The principal artifacts of this lowest layer in the former site consisted of two whole coiled basketry bowls, whereas the principal artifacts of level I at the Alvey Site were an atlatl fragment and a few dart points. The majority of pottery at all sites except the Alvey Site is Fremont (Emery Gray and Snake Valley Gray). There is a mixture of Fremont and Anasazi pottery from level II of the Alvey Site, but Anasazi pottery predominated in level III (over 90%), including a variety of decorated ceramic types.

Radiocarbon Dating

Sampling Method

All sites discussed above yielded abundant organic remains, vast quantities of which were collected during excavation and are currently housed at the Utah Museum of Natural History. These collections provide a means to radiocarbon date the excavated sites. Maize cobs and kernels were selected for radiocarbon analysis because maize dates provide an accurate estimate, within the confidence limits of the sample, of when the plant was grown. As an annual plant, the problems inherent with dating wood (e.g., Smiley 1985) do not apply to maize, plus there is no question about cultural association, because its distribution and propagation are dependent on humans. Additional benefits of dating maize in this instance include the fact that cobs and other plant portions were abundant at all of the sites. This allowed sufficiently large samples to be selected for standard radiocarbon determinations without compromising the integrity of the collections for future analyses. The ability to make standard determinations rather than more costly accelerator determinations meant that more samples could be processed.

The number of samples processed per site depended on the stratigraphy observed by the excavators. The objective was to select two samples to represent each definable major episode of occupation at each alcove. Since Sheep Horn Alcove, Pantry Alcove, and Gates Roost had but a single definable unit of cultural deposition, just two samples each were adequate for present purposes. In the end, limited funds allowed only a single sample from Gates Roost to be processed.

Triangle Cave and the Alvey Site both had several distinct units of occupation, so more than two samples per site were clearly desirable. At a gross level, both of these alcoves had three separate units of occupation: preceramic, plain gray ceramic, and mixed Anasazi–Fremont ceramic, including both decorated and corrugated pottery. Because the former two occupations were of principal interest, and because the Anasazi-decorated

wares from the upper layers of the alcoves provided relatively good temporal estimates, most samples were selected from the two early occupation units. In the end, two samples each were processed for strata 1 and 2 of Triangle Cave, the preceramic and plain gray ceramic layers; and one sample was processed from the mixed Anasazi–Fremont ceramic layer of stratum 3. At the Alvey Site, a single sample was processed from each of the three levels—the preceramic level I, level II with plain gray ceramics, and the largely Anasazi ceramic level III.

Results and Discussion

The 12 cob samples were submitted to Beta Analytic for standard radiocarbon analysis plus correction for C-13 fractionation. The single kernel sample was submitted to the National Science Foundation Accelerator Facility, University of Arizona, for accelerator radiocarbon analysis plus correction for isotope fractionation. Analysis results are presented in Table 1; Table 2 presents the calibrated calendrical ages of the C-13 adjusted ages. The 1 sigma calibrated ages are plotted in Fig. 3.

The broad pattern of Fig. 3 reveals a series of 11 significantly overlapping radiocarbon dates spanning the centuries circa A.D. 200 to 900. There are no substantial breaks in this span that could be construed as evidence for discrete occupational episodes. There is also a similar lack of stratigraphic evidence at Triangle Cave and the Alvey Site to argue for significant abandonment of the region at any time between A.D. 200 and 900.

The dated maize specimens in the A.D. 200–900 span were associated with abundant Fremont remains; only Fremont cultural diagnostics were found at Sheep Horn Alcove and Pantry Alcove. This is also true for Gates Roost, except for five sherds from a single, plain gray jar of unusual paste and temper that was classified as North Creek Gray in the excavation report. The occupants of these three sites seem to have had very little interaction with Anasazi populations to the south or east.

Both of the stratified sites (Triangle Cave and the Alvey Site) clearly experienced Anasazi occupancy during the later histories of their use (post-A.D. 1000), but before the strong Anasazi presence, both alcoves seem to have had Fremont occupations. Stratum 2 at Triangle Cave contained Fremont ceramics, basketry, moccasins, and other remains, whereas the underlying preceramic stratum 1 had Fremont basketry and Fremont Dent maize. The middle layers at the Alvey Site, which Gunnerson (1959) lumped together as level II for reporting purposes, contained Fremont basketry, plain gray Fremont ceramics, and other plain gray sherds that were identified as North Creek Gray.

Two dates from the Alvey Site fall outside the main date sequence—sample 12 from level I and sample 11 from level III. Sample 12 is quite distinct, with a midpoint more than 600 years older than the midpoint of the next oldest sample. Sample 12 is currently the oldest directly dated maize from Utah. Though only one date was obtained from level I, there is no reason

Table 1. Radiocarbon analysis results for 13 maize samples from the lower Escalante River basin.

Site	Sample number	FS number	Number of cobs[a]	Lab number	C-14 B.P.	C-13/C-12	C-13 adjusted age
Sheep Horn Alcove	1	5.1	1	Beta-34934	1,300 ± 100	–11.5	1,520 ± 100
(42GA102)	2	34.1	2	Beta-34935	970 ± 70	–11.9	1,180 ± 70
Pantry Alcove	3	49.1	4	Beta-34936	1,420 ± 80	–12.0	1,640 ± 80
(42GA103)	4	91.1	4	Beta-34937	1,360 ± 70	–12.1	1,570 ± 70
Triangle Cave	5	27.1	8	Beta-34938	1,330 ± 80	–10.1	1,570 ± 80
(42GA288)	6	62.7	4	Beta-34939	1,040 ± 70	–11.2	1,270 ± 70
	7	127.1	2	Beta-34940	1,250 ± 50	–11.0	1,480 ± 50
	8	137.19	3 kernels	AA-5224		–10.3	1,600 ± 50
	9	161.1	1	Beta-34941	1,550 ± 90	–11.2	1,770 ± 90
Alvey Site	10	86	1	Beta-34942	1,460 ± 80	–11.1	1,690 ± 80
(42KA172)	11	87.2	1	Beta-34943	730 ± 100	–10.6	970 ± 100
	12	126.2	1	Beta-34944	2,030 ± 90	–10.8	2,260 ± 90
Gates Roost (42KA178)	13	17	2	Beta-34945	1,170 ± 70	–9.8	1,420 ± 70

[a] When more than a single cob is listed, the sample consisted of cob fragments.

Table 2. Calibration results for the 13 radiocarbon dates of Table 1. (Calibration was done with the 1987 CALIB program [Stuiver and Reimer 1986] using the 20-year data set and Method A.)

Site	Sample number	Midpoint	1 sigma range	2 sigma range
Sheep Horn Alcove	1	A.D. 548	A.D. 420–640	A.D. 264–670
(42GA102)	2	A.D. 880	A.D. 772–953	A.D. 670–1000
Pantry Alcove	3	A.D. 411	A.D. 264–530	A.D. 230–600
(42GA103)	4	A.D. 447	A.D. 411–562	A.D. 268–630
Triangle Cave	5	A.D. 447	A.D. 404–592	A.D. 260–640
(42GA288)	6	A.D. 716, 743, 757	A.D. 666–852	A.D. 640–890
	7	A.D. 596	A.D. 543–633	A.D. 440–660
	8	A.D. 429	A.D. 404–535	A.D. 340–560
	9	A.D. 244	A.D. 128–382	A.D. 60–440
Alvey Site	10	A.D. 348, 367, 371	A.D. 244–425	A.D. 130–540
(42KA172)	11	A.D. 1027	A.D. 980–1170	A.D. 880–1260
	12	379 B.C.	400–199 B.C.	520–100 B.C.
Gates Roost (42KA178)	13	A.D. 637	A.D. 567–664	A.D. 458–690

to doubt its validity. This date is chronostratigraphically consistent with the dates from levels II and III. Sample 12 is about 200 years older than the maize from the Elsinore Burial (Wilde and Newman 1989). Maize kernels in a loosely twined basket from Dinosaur National Monument initially seemed quite early since the basket was dated 2330 ± 80 years B.P.; however, the maize turns out to have an age of 1650 ± 80 years B.P. (Jim Truesdale, National Park Service, Dinosaur National Monument, personal communication). Because few remains were recovered from level I of the Alvey Site, the cultural association of sample 12 is unknown. The date is essentially contemporaneous with two recent radiocarbon determinations on Basketmaker II remains from the southern portion of Glen Canyon (Nickens et al. 1988; Geib 1990) and with the Basketmaker II occupation south of Glen Canyon (Matson 1992). It is possible that the Alvey Site was used by an early Basketmaker II group, but only further investigation of this significant site will tell.

The age of sample 11 from level III of the Alvey Site is consistent with the Pueblo II Anasazi decorated wares from this level. This date is the only one that corresponds with the traditional temporal placement of the Fremont

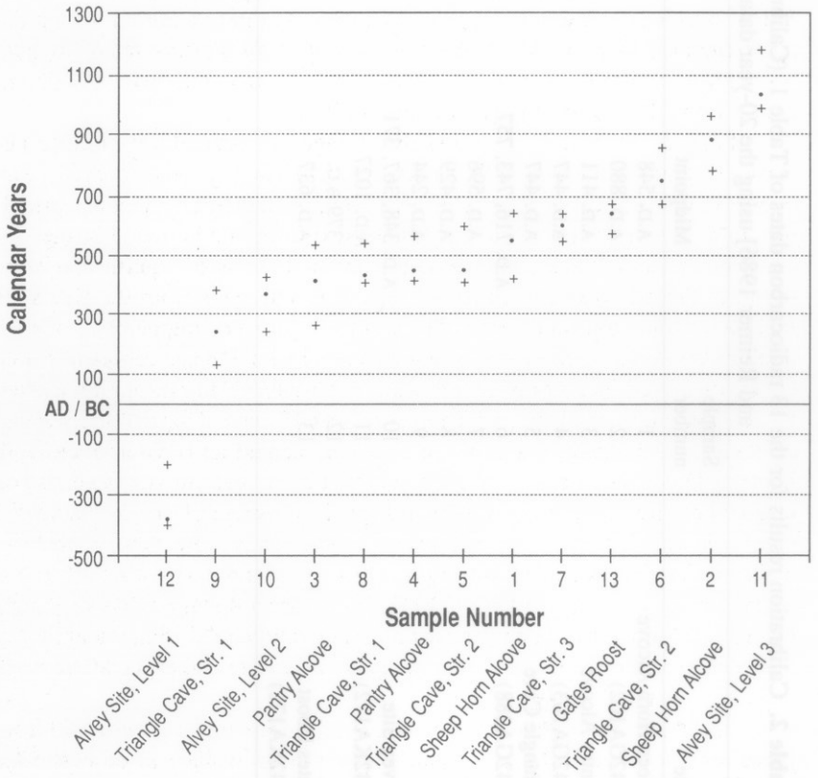

Fig. 3. Array of calibrated and C-13 corrected radiocarbon dates on maize from Fremont sites of the lower Escalante River basin (1 sigma age ranges plotted).

occupation of Glen Canyon. It is also the only date associated with abundant Anasazi remains. Though Anasazi and Fremont materials were variously mixed in the upper levels of both the Alvey Site and Triangle Cave, this seems partly the result of pothunting. This is especially true of the mixed Anasazi–Fremont ceramic assemblage from stratum 3 of Triangle Cave.

Conclusions

The suite of maize radiocarbon dates reported here supports the inference that the Fremont occupation of the Escalante River drainage basin spanned roughly 7 centuries without an apparent hiatus, from about A.D. 200 to 900. Therefore, the principal Fremont occupation of Glen Canyon was not during A.D. 1050–1250, as originally thought, but took place centuries earlier. Rather than occurring when Glen Canyon was intensively occupied by the Anasazi, the Fremont occupation apparently occurred during a time when the region was little used by the Anasazi. During this Fremont occupation, there was apparently significant continuity in material remains from the preceramic to the ceramic period. This is best expressed at Triangle Cave and the Alvey Site. Ceramics are the only noteworthy material culture addition during the approximate 700-year span of the maize chronology. Pottery seems to have been introduced sometime between A.D. 400 and 550, but there is no apparent occupational break associated with this addition.

Reliance on domesticates and the storage of horticultural produce occurred during the entire Fremont occupation, starting several hundred years before the introduction of ceramic technology. The significance of agriculture in the local Fremont economy is attested to by the veritable bushels of cobs, husks, and stalks of maize and rinds and stems of squash that were found in the alcoves. The collected sample of cultigens from the five sites includes a few thousand maize cobs and cucurbit rind fragments, at least a hundred cobs skewered on sticks, a dozen or so whole maize ears, and whole cucurbits turned into storage containers. After having dug through the often thick accumulations of cultigen debris, the significance of agriculture was not an issue to the excavators of these sites—it seemed an obvious fact. Both Pantry Alcove and Sheep Horn Alcove, with their numerous storage cists and lack of hearths, were thought to have served as storage places for harvested crops (Fowler 1963:21, 26), whereas the other sites were thought to have been seasonally occupied during the growing and harvesting of crops (Gunnerson 1959:36; Fowler 1963:38). More direct dietary evidence comes from a few human feces analyzed for their macrobotanical component by Fry (1976). Though the sample is admittedly small, maize and especially squash were significant dietary constituents.

The continuity in Fremont occupation of the Escalante River basin from preceramic to ceramic times and the apparent significance of domesticates throughout the span of occupation underscore in an important way Wilde and Newman's (1989:718) point concerning the Archaic–Formative transition in

central Utah: "In effect, all that was needed to formally define the Fremont was the addition of ceramics to the suite of traits that already included pithouse architecture, storage structures, and corn horticulture." As such, it seems appropriate to consider preceramic horticulturalists of the Fremont region as something other than Archaic. Berry and Berry (1976:33) thought so too and advocated the Basketmaker II label. The unavoidable cultural–historical implications of this term, ones fully intended by the Berrys, seem unsupported by the archaeological record or, at least, have yet to be adequately demonstrated. The approach advocated here is to recognize the existence of preceramic Fremont populations and to use the introduction of agriculture rather than the appearance of pottery as cause for applying the Formative term Fremont.

The critical period for understanding the Archaic–Formative transition for the Fremont area is several centuries before the Christian era, when hunter–gatherers first acquired domesticates or came into contact with early farmers. In the Escalante River basin this interval is apparently represented by level I of the Alvey Site. A concerted effort must be made to locate and investigate these early horticultural sites. One obvious place to start would be to research existing collections such as those of Morss (1931) along the Fremont River. I am sure that these collections, like those of the Escalante River basin examined here, still have considerable research potential.

Acknowledgments

This research is part of a multiyear archaeological study of the Glen Canyon National Recreation Area supported by the National Park Service under Contract CX-1200-4-A061 with the Archaeology Laboratory of Northern Arizona University. H. Fairley was a stimulus and sounding board for many of the ideas presented here and elsewhere in documents related to the overall study. C. Kincaid aided the project. C. Phagan provided needed critical input and direction for the overall study and commented on an earlier version of this paper. A. J. Lindsay, D. Madsen, R. G. Matson, and an anonymous reviewer also provided helpful comments. L. Casjens and A. Hanniball assisted in researching collections at the University of Utah. D. Donahue, University of Arizona—National Science Foundation Accelerator Facility, provided the radiocarbon date on maize kernels.

Literature Cited

Berry, M. S., and C. F. Berry. 1976. An archaeological reconnaissance of the White River area, northeastern Utah. Antiquity Section Selected Papers 4, Division of State History, Salt Lake City. 39 pp.

Boison, P. J. 1983. Late Pleistocene and Holocene alluvial stratigraphy of three tributaries in the Escalante River basin, Utah. M.S. thesis, University of California, Santa Cruz. 118 pp.

Boison, P. J., and P. C. Patton. 1985. Sediment storage and terrace formation in the Coyote Gulch basin, south-central Utah. Geology 13:31–34.

Fowler, D. D. 1963. 1961 Excavations, Harris Wash, Utah. University of Utah Anthropological Papers 64, Salt Lake City. 106 pp.

Fowler, D. D., and C. M. Aikens. 1963. 1961 excavations, Kaiparowits Plateau, Utah. University of Utah Anthropological Papers 66, Salt Lake City. 100 pp.

Fry, G. F. 1976. Analysis of prehistoric coprolites from Utah. University of Utah Anthropological Papers 97, Salt Lake City. 45 pp.

Geib, P. R. 1990. A Basketmaker II wooden tool cache from lower Glen Canyon. Kiva 55:265–277.

Geib, P. R., and P. W. Bungart. 1989. Implications of early bow use in Glen Canyon. Utah Archaeology 1989 2:32–47.

Geib, P. R., and H. C. Fairley. 1986. An archaeological survey of Bowns Canyon, Kane County, Utah. Pages 91–171 *in* P. R. Geib, H. C. Fairley, and P. W. Bungart. Archaeological survey in the Glen Canyon National Recreation Area: year 1 descriptive report, 1984–1985. Northern Arizona University Archaeological Report 999, Flagstaff.

Geib, P. R., H. C. Fairley, and M. Davenport. 1987. Archaeological survey of Cow Canyon. Pages 4–49 *in* P. R. Geib, P. W. Bungart, and H. C. Fairley, editors. Archaeological investigations along the lower Escalante drainage: Glen Canyon year 2 report, 1985–1986. Northern Arizona University Archaeological Report 1000, Flagstaff.

Gunnerson, J. H. 1959. 1957 excavations, Glen Canyon area. University of Utah Anthropological Papers 43, Salt Lake City. 163 pp.

Jennings, J. D. 1966. Glen Canyon: a summary. University of Utah Anthropological Papers 81, University of Utah Press, Salt Lake City. 84 pp.

Lipe, W. D. 1967. Anasazi culture and its relationship to the environment in the Red Rock Plateau region, southeastern Utah. Ph.D. dissertation, Anthropology Department, Yale University. University Microfilms, Ann Arbor, Mich. 406 pp.

Lister, F. C. 1964. Kaiparowits Plateau and Glen Canyon prehistory: an interpretation based on ceramics. University of Utah Anthropological Papers 71, Salt Lake City. 91 pp.

Matson, R. G. 1992. The origins of Southwestern agriculture. University of Arizona Press. 350 pp.

Morss, N. 1931. The ancient culture of the Fremont River in Utah. Papers of the Peabody Museum of Archaeology and Ethnology 12(3), Harvard University, Cambridge, Mass. 81 pp.

Nickens, P. R., A. D. Reed, and T. R. Metzger. 1988. Investigations at the Rock Creek Alcove: an early Basketmaker II burial site in Glen Canyon National Recreation Area, Utah. The Kiva 53:235–252.

Schaafsma, P. 1971. The rock art of Utah. Papers of the Peabody Museum of Archaeology and Ethnology 65, Harvard University, Cambridge, Mass. 169 pp.

Smiley, F. E., IV. 1985. The chronometrics of early agricultural sites in northeastern Arizona: approaches to the interpretation of radiocarbon dates. Ph.D. dissertation, University of Michigan. University Microfilms, Ann Arbor. 498 pp.

Stuiver, M., and P. J. Reimer. 1986. A computer program for radiocarbon age calibration. Radiocarbon 28:1022–1030.

Wilde, J. D., and D. E. Newman. 1989. Late Archaic corn in the eastern Great Basin. American Anthropologist 91:712–720.